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# BULLETIN

## State Board of Education

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SUPPLEMENT No. 4

### VOCATIONAL EDUCATION

*Virginia*  
Plan of the State Board for

Vocational Education



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## State Board for Vocational Education

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## INTRODUCTION.

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The Assembly of Virginia of 1918, passed a law accepting the conditions under which the Federal aid provided by the Smith-Hughes Act to provide for the promotion of vocational education may be secured. The Virginia statute appropriated money to meet dollar for dollar the Federal funds for the following purposes:

- (a) For the salaries of teachers, supervisors, or directors of agricultural subjects.
- (b) For the salaries of teachers of trades and industrial subjects and home economics.
- (c) For the maintenance of courses preparing teachers, supervisors, and directors of agricultural subjects, and teachers of trades and industrial and home economics subjects.

Under the Virginia Act, the State Board of Education is named as the State Board for Vocational Education and therefore assumes the responsibility, in co-operation with the Federal Board for Vocational Education, of carrying out the provisions of the Federal law.

The present plan is offered in order to define as clearly as possible the policy of the State Board for Vocational Education. It attempts to furnish pertinent information to local school boards or institutions which may apply for funds for vocational education, and also to give those which accept or have accepted funds, sufficient directions to insure full compliance with the provisions of the law.

The State Board earnestly desires that vocational education receive the serious consideration it deserves. Social and economic conditions in our State demand that constructive thought be given to the development of trained workers on the farm, in the shop and in the home. It will be the policy of the Board to co-operate in every way possible in the development of this training. However, careful restrictions and regulations must guard the use of Federal aid State funds for vocational education to insure against waste and to guarantee reasonable vocational efficiency.

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### I. ADMINISTRATION AND SUPERVISION.

1. General Direction. The Smith-Hughes Bill creates a Federal Board for Vocational Education for the general administration of the provisions of the act.

The State Board of Education is the State Board for Vocational Education. The President of the State Board, Harris Hart, is the chief executive officer of the State Board for Vocational Education.

The county or city school board is the local authority with which the State Board will deal, and the officers of such boards are the responsible agents for the proper local administration of the funds for vocational education.

The Federal Board will deal with the vocational education in Virginia, only through its trustees, the State Board. The Federal Board does not

undertake to prepare plans of operation nor courses of instruction for the State. Such plans and courses must be prepared by the State Board and be approved by the Federal Board before becoming operative.

No State can claim by right, money from the Smith-Hughes fund; its claim can be based solely on its readiness and capacity to meet the conditions of the Federal Act. In like manner no local board can claim by right an appropriation from the Federal and State fund. The State Board will give careful and sympathetic attention to every local appeal and within the limits of funds at its disposal will grant such appeals as give promise of the highest vocational efficiency.

2. Agricultural education is under the special supervision of a State supervisor. He visits all the agricultural departments in high schools, advises as to the best methods of instruction, examines the equipment, studies the project work and reports to the State Board conditions and recommendations for improvement.

The plan of supervision shall include:

A. Improvement of teachers in service.

(a) Systematic visitation of teachers or local supervisors for individual help.

(b) Definite reports from teachers or local supervisors on work done and methods of instruction used. In order to have these reports result in benefit to the teacher, the State supervisor shall provide for careful criticism and reports on the same to be sent back to the teacher or supervisor.

(c) State and sectional meetings of the teachers at which the supervisor may himself give instruction or provide other instruction.

(d) A period of professional improvement for teachers.

(e) Co-operation between teacher-training institutions and the State supervisory staff so that all teacher-training may be co-ordinated.

B. Inspection of schools.

C. Assistance in the establishment of new schools and classes.

D. Preparation of bulletins and other special literature.

3. Trade and industrial education is under the special supervision of the State supervisor.

The plan of supervision will consist first of a general industrial survey of the five leading cities of the State of Virginia. This survey is to be made by the supervisor of trade and industrial education. It must show the various industrial plants, with the number of skilled, semi-skilled, and unskilled laborers; must show the more important industrial occupations of the cities; must give the occupations of school patrons whose children are in the sixth, seventh, and high school grades, and from this material must deduce certain facts which would indicate the lines of industrial work the schools may best set up.

After this industrial survey has been completed, the cities in Virginia which offer the best opportunity for the development of industrial education shall be visited by the supervisor, who shall take the matter up with the school board, the Chamber of Commerce, and other municipal organizations. He shall interpret to them what lines of work the school should undertake

as indicated by the survey, shall assist the local school authorities in mapping out programs of work and shall explain in detail all the requirements set up by the Federal Board and the State Board for Vocational Education.

After this period of propaganda has led to the development of trade and industrial work, the supervisor shall visit the cities in which this work is maintained frequently enough to be assured that this work is developing in accordance with the plan set up.

The supervisor of trade and industrial education shall give particular attention to the training of teachers for unit trade courses, conducted in the city of Richmond, and to the training of teachers of related subjects carried on at the Virginia Polytechnic Institute. He shall visit the teachers in the service and shall observe the peculiar needs of such teachers, and in turn, shall advise the State Board for Vocational Education what changes or improvements are desirable in the method of teacher-training.

The qualifications of a supervisor for trade and industrial work shall be graduation from a standard high school and graduation from a four-year technical or industrial institute, or its equivalent, with at least two years' practical contact with industrial work in a supervisory capacity. The supervisor must be qualified to prepare courses of study for the various trades and industries, to understand the qualifications of teachers for general shop work and unit shop work, and must be qualified particularly to interpret the rules of the Federal and State Boards and to see to their proper execution.

#### 4. Home Economics Education.

##### a. Plan of Supervision.

- (1) Improvement of teachers in service.
- (2) Itinerant teacher-training.
- (3) Promotion of new work.
- (4) Inspection of work.

##### b. Qualifications of Supervisor.

- (1) Two years of practical experience including a reasonable period of actual management of a home.
- (2) Graduate of a four-year college course designed to prepare teachers of vocational home-making. Such a course should be an all around course in home-making.
- (3) Professional training shall include general courses in education, and special methods and practice teaching in home economics.
- (4) At least two years of successful experience in teaching home economics, and administrative experience if possible.

5. Teacher-training will be under the direction of the State Board for Vocational Education. At the several institutions at which it is established the local supervisor in charge will exercise careful supervision over the work and report through the president of the institution to the State Board. A supervisor from the Board will make inspection of the teacher-training to see that all conditions fixed by the Board are carried out.

## II. GENERAL CONDITIONS.

The following general conditions must be carefully observed otherwise no Federal or State funds for vocational education can be allowed.

1. The education shall be under public supervision or control.
2. The controlling purpose of the education is to fit for useful employment.
3. The education shall be less than college grade.
4. The education shall be designed to meet the needs of persons over fourteen years of age, who have entered upon, or are preparing to enter upon some useful employment. At least ten pupils are required to form a department in any one of the vocational branches. Where it is impossible to meet this minimum requirement, an exception may be made, subject to the approval of the State Board.

5. Every dollar of Federal funds for agriculture and for teacher-training shall be matched by a dollar of State funds. Every dollar of Federal funds for trades, industry, and home economics shall be met with a dollar of State funds and a dollar of local funds.

If at the end of the fiscal year, however, the total amount of Federal and State money provided for this purpose is not expended, the State Board will reimburse the local boards on a pro rata basis from such a balance.

6. Federal and State funds shall be used for the following purposes exclusively:

- A. Salaries of teachers, supervisors and directors of agriculture.
- B. Salaries of teachers, supervisors and directors of trade and industrial and home economics subjects properly qualified under the standards set up by the State Vocational Board and in accordance with the terms of the Smith-Hughes Act.
- C. Maintenance of teacher-training for vocational teachers. No part of the Federal or State funds can be used to purchase real estate, to construct buildings, or to provide equipment.

Of the amount (B) for salaries of teachers of trades, industrial subjects and home economics, at least  $33\frac{1}{3}$  per cent. of the Federal fund shall be applied to part-time schools or classes for workers over fourteen years of age who have entered upon employment. Not more than 20 per cent. of the fund (B) appropriated for salaries of teachers of trades, industrial subjects and home economics shall be used for home economics.

An amount not to exceed 15 per cent. of the total amount for teacher-training (C) may be used by the State Board for Vocational Education to pay the salaries and expenses of State supervisors of vocational education in each one of the three lines of work. The remainder of the teacher-training fund shall be so distributed that  $33\frac{1}{3}$  per cent. may be used for the preparation of teachers, supervisors or directors of agricultural subjects,  $33\frac{1}{3}$  per cent. for the preparation of teachers, supervisors or directors of trades and industrial subjects, and  $33\frac{1}{3}$  per cent. for the preparation of teachers, supervisors and directors of home economic subjects.

Funds for vocational education will be paid by the State Board to the local board or institution in the form of reimbursement for money already



expended. Payments will be made quarterly, on reports sent to the State Board on the first of October, January, April and July. Forms for these reports will be furnished which must show precisely how and for what purpose funds have been spent. Reimbursement will be made from Federal and State funds to the amount appropriated only on condition that the provisions of the State plan for vocational education have been properly carried out.

7. How teachers of vocational education are elected and paid. Teachers of vocational education shall be elected by the local school boards in such manner as others are elected. Every precaution must be taken to secure teachers whose qualifications meet the minimum requirements for vocational teachers, fixed by the State Board. No reimbursement for salary will be made for any teacher who falls short of those requirements.

Teachers of vocational education shall be paid in the same manner as regular teachers, the local board receiving reimbursement each quarter as provided in this plan.

The teacher of agriculture shall be engaged for twelve months at a minimum annual salary of \$1,500. The home economics teacher shall be engaged for not less than nine months and be paid a salary of not less than \$675.00.

### III. AGRICULTURAL EDUCATION.

#### 1. KINDS OF SCHOOLS.

Agricultural education may be offered as a department in regular high schools, in part-time schools, and in evening schools.

#### 2. PLANT AND EQUIPMENT.

The following are the requirements for plant and equipment which must be furnished by the local school board before any Federal or State funds are allowed:

(a) A room equipped primarily for instruction in agriculture. Such a room should not be fitted up with the ordinary seats and desks of the schoolroom, but should have movable tables and chairs which may, on occasion, be moved to one side in order to provide for demonstrations requiring large apparatus, or even the presence of a coop of chickens.

(b) Sufficient equipment to demonstrate the ordinary improved scientific methods of testing milk, incubating eggs, grafting trees, testing soils, etc. A minimum of \$350 must be provided for this equipment.

(c) Suitable cabinets for properly storing apparatus and properly caring for materials collected in the community, such as grains, grasses, fruits, vegetables, small implements, poultry, feeds, animal feeds, etc.

(d) A collection of at least thirty-five reference books and not less than one hundred bulletins, properly catalogued.

(e) The school should subscribe to at least five farm journals.

(f) A farm shop, approximately 30 x 50 feet in size, equipped for teaching wood work, forge work, and cement work. The cost of equipment should not be less than \$750.

(g) Five acres of land, adjacent to, or near the school.

## 3. MINIMUM FOR MAINTENANCE.

The local school board shall provide an annual amount for maintenance sufficient to replace or replenish the equipment mentioned above in paragraphs (a), (b), (c), (d), (e) and (f) in such manner that the value of such equipment will be at the beginning of each school year at least equal to the minimum in each case. A minimum of \$5.00 per pupil per year should be provided for this purpose.

## 4. COURSES OF STUDY.

*A. Course of Study for Departments of Vocational Agriculture**First Year (8th Grade)*

## Non-Vocational:

English .....	5	40-minute periods.....	1	unit
Algebra .....	5	40-minute periods.....	1	unit
General Science .....	3	40-minute periods and 2 80-minute periods .....	1	unit

## Vocational:

Plant Production (Agronomy)...	5	80-minute periods.....	1	unit
Farm Shop Work.....	2	80-minute periods.....	}	$\frac{1}{2}$ unit
Supervised Project .....	Average of 5 hours and 40 minutes for 9 months....			
				<hr/>

*Second Year (9th Grade)*

## Non-Vocational:

English .....	5	40-minute periods.....	1	unit
Plane Geometry .....	5	40-minute periods.....	1	unit
Economic Geography .....	5	40-minute periods.....	1	unit

## Vocational:

Animal Production				
(Animal Husbandry).....	5	80-minute periods.....	1	unit
Farm Shop Work.....	2	80-minute periods.....	}	$\frac{1}{2}$ unit
Supervised Project.....	Average of 5 hours and 40 minutes for 9 months....			
				<hr/> 4 $\frac{1}{2}$ units

*Third Year (10th Grade)*

## Non-Vocational:

English .....	5	40-minute periods.....	1	unit
Farm Arithmetic and Elementary Bookkeeping .....	5	40-minute periods.....	1	unit
Human Biology .....	3	40-minute periods and 2 80-minute periods .....	1	unit

## Vocational:

Horticulture and Field Crops.....	5	80-minute periods.....	1	unit
Farm Shop Work.....	2	80-minute periods.....	}	$\frac{1}{2}$ unit
Supervised Project.....	Average of 5 hours and 40 minutes for 9 months....			
			<hr/>	4 $\frac{1}{2}$ units

Fourth Year (11th Grade)

Non-Vocational:

English .....	5	40-minute periods.....	1	unit
History and Civics.....	5	40-minute periods.....	1	unit
Chemistry or Physics.....	3	40-minute periods and 2 80-minute periods .....	1	unit

Vocational:

Rural Engineering, Farm Mechanics, Farm Management and Rural Economics.....	5	80-minute periods.....	}	1	unit	
Farm Shop Work.....	2	80-minute periods.....		Average of 5 hours and 40 minutes for 9 months....	$\frac{1}{2}$	unit
Supervised Project.....						
				—		
				$4\frac{1}{2}$	units	
				=		
Total Academic Units....				16	units	
Project Units .....				2	units	

This course, as outlined, makes provision for four years of secondary grade work, and offers a well-rounded course, since one-half of the time is devoted to the academic, or non-vocational subjects. These academic subjects are the same as those offered in the regular course of the rural and small town high schools, and the students of vocational agriculture pursue these courses with the non-vocational pupils.

While the vocational work should average not less than three hours per day for nine months, it is not necessary that the three hours of work be done in the school. The supervised project work may be done on the home farm, and school credit will be allowed for this work. A minimum, however, of eighty consecutive minutes each day of vocational work must be taught in each school which offers vocational work.

The supervised project may be conducted on the school farm or on the home farm, although it is advisable that, wherever possible, the student carry out his project on his home farm. This supervised project must be conducted through a period of at least six months, and it is highly desirable that it continue through the entire year. The home project is the basis of the vocational work in agriculture, and the student, therefore, should be at work on some sort of agricultural project all the while that he is enrolled as a student of vocational agriculture.

The project should be one which bears a direct relation to the work done at the school; for instance, since the vocational work of the first year is Plant Production, the supervised project should be a Plant Production project. During the second year, the vocational work consists of Animal Production: the project work, therefore, should be the raising of a calf, pigs, chickens, or any sort of farm animal or animals.

In each year in which farm shop work is taught, the work should be correlated with the agricultural subjects studied.

*B. Course of Study for Evening Classes in Vocational Agriculture*

Evening classes are planned primarily for men of maturity, now employed as farmers or operating their own farms. Such courses may be given

in the high schools in which departments of vocational agriculture are subsidized by the State and Federal Governments and may be given by the regularly qualified teachers of vocational agriculture.

Since these courses will be of a highly specialized nature, no attempt is made here to indicate the particular agricultural subjects which may be offered in the various sections of the State. Under "Agriculture" is indicated the amount of time which should be devoted to Dairying, Sheep Raising, Poultry Raising, Orchardring, Crop Production, or the specialty that will be studied.

Agriculture .....	90 minutes per day for 8 weeks.
English (The Study of Farm Journals) .....	40 minutes per day for 8 weeks.
Project Work .....	90 minutes per day for 6 months.

### *C. Course of Study for Part-Time Classes*

Part-time classes will be offered chiefly for boys and young men who have recently been in attendance at school, but who are now engaged in farming, and who wish to avail themselves of the advantages offered by the department of vocational agriculture which have been established in their communities. The agricultural instruction given will be supplementary to the particular kind of farming in which they are engaged.

No attempt is made here to indicate the type of agricultural work or specialty which should be offered, since this will vary for the various sections of the State, and the training which the students have had. The time specified for "Agriculture" indicates the time to be devoted to the agricultural occupation studied.

Agriculture .....	90 minutes per day for 12 weeks.
Farm Shop Work .....	90 minutes per day for 12 weeks.
Project Work .....	90 minutes per day for 6 months.
Farm Arithmetic .....	40 minutes per day for 12 weeks.
English .....	40 minutes per day for 12 weeks.

## 5. METHODS OF INSTRUCTION.

Practical work, laboratory work, and theoretical instruction should be required, and the methods of instruction in these various lines should be such as to best prepare the pupils for the occupation of farming. The instruction should be carried on with the primary aim of production rather than scientific investigation. This does not mean that either the principles or the methods of science should be ignored. Laboratory and recitation work should not be separated into distinct phases. That is, a certain time each day should be set aside for agricultural instruction and the question whether this instruction is to consist of discussion, recitation, or laboratory work, or a combination of two or more of these, should depend not on the fact that it is a certain day of the week, but upon whether the particular subject under consideration lends itself to that kind of treatment. The work of a single day might comprise some demonstration

work, some recitation work, and some laboratory work. The sequence of topics should not necessarily be that of the text-book, but should follow the growing season, and the stress given to a particular topic should depend upon the importance of the topic to the farmers of the community rather than upon the number of pages which the text-book devotes to the topic. The amount of material available for the concrete instruction should have some influence upon the selection of and emphasis given to topics. Instruction should be planned for out-of-doors, as well as for indoors. The pupils should be brought into contact with those who are following good principles and practices in agriculture.

#### 6. QUALIFICATIONS OF TEACHERS.

Teachers of vocational agriculture shall have the following qualifications:

- (a) A four-year college course in agriculture, based on entrance requirements as follows:

Completion of a standard four-year high school course or its equivalent.

Two years' practical experience in farm work or in intimate contact with such work.

- (b) He should know and be in sympathy with farm life, not theoretically, but from actually having been in the place of the pupils whom he is teaching.
- (c) The teacher of agriculture should be a man who will command the respect of the farmers of the community, not only because of his experience in farming and his training in the science of agriculture, but also because he possesses qualities of leadership. It is to be remembered that the teacher of agriculture needs to be not only the teacher in the school, but also the friend and helper of all of the farmers of the community.

#### 7. QUALIFICATIONS OF SUPERVISORS OR DIRECTORS.

The qualifications of supervisors or directors of agriculture shall be at least such as to meet the standards set for teachers of agriculture, and in addition at least two years of successful experience in teaching or supervising agriculture is required. It is desirable that supervisors and directors have made some special study of general problems of vocational education, particularly in relation to secondary schools.

#### 8. PLANS FOR AT LEAST SIX MONTHS' SUPERVISED PRACTICAL WORK.

In each course of study outlined in this plan, provision is made for at least six months of supervised practical agriculture. This supervised practical work which constitutes the "project work" of the pupil may be conducted on the school farm or the home farm of the pupil—it is recommended, however, that, wherever possible, this work should be done on the home farm.

The home project is an enterprise undertaken by the boy with full responsibility on his part for both the financing of the project and the doing of the work, although he may not necessarily do all of the work himself.

This should be a business enterprise involving the keeping of books, the taking of inventories, and the making of final statements.

In addition to the project, certain home laboratory exercises may be carried on, such as the testing of milk from a certain number of cows, or the treatment of seed potatoes for scab, or the testing of the germinating powers of seed corn, or the grafting of fruit trees.

#### IV. TRADES, HOME ECONOMICS AND INDUSTRIAL EDUCATION.

1. The Federal fund available for trade, home economics and industrial education will be used for the following types of classes with the approximate distribution indicated:

A. Evening schools or classes.....	18%
B. Part-time schools or classes.....	33 $\frac{1}{3}$ %
C. Unit trade schools or classes.....	18%
D. Industrial schools or classes in cities of less than 25,000 .....	10 $\frac{2}{3}$ %
E. Home Economics .....	20%

For every dollar of the above amount of Federal funds expended, the State will expend one dollar and the local board will expend one dollar. If, at the end of the fiscal year however, the total amount of Federal and State money provided for this purpose is not expended, the State Board will reimburse the local boards on a pro rata basis from such a balance.

##### 2. Trade and Industrial Education.

A. The State Board proposes to aid from the Federal funds, the following kinds of trade and industrial education:

- (a) In evening industrial classes, the instruction shall be supplementary to the daily employment and shall include classes for machinists, molders, carpenters, plumbers, etc.: for women; courses in sewing, dressmaking, cooking, millinery, etc.

It should be understood that the term "Evening Schools" is considered to mean work given to persons at hours other than those of actual employment. "Evening Schools" then becomes a generic term descriptive of work rather than of the particular time of day when the class is in session.

- (b) In part-time schools or classes.
  - (1) Trade extension courses will be offered those already engaged in some trade who desire more thorough training in that trade. The work will supplement the daily employment and be adapted to the immediate needs of those who apply for the course.
  - (2) Trade preparatory classes will be conducted for those who have entered one industrial pursuit or trade and desire training in a different trade.
  - (3) General continuation part-time classes will be conducted for persons engaged in any useful employment who de-

sire courses which will contribute to their intellectual and vocational development.

Close correlation of school instruction with shop work is regarded as being of vital importance in part-time work, and one means of insuring this correlation will be found, it is believed, in the appointment of co-ordinators. In order to encourage the States to develop part-time education under section 2 of the act and to provide proper correlation between the school and the shop, factory, home, office, etc., where the pupil is employed, the Federal Board has made the following ruling beginning with the fiscal year ending June 30, 1918:

"Instructors in part-time schools and classes paid in part from Federal money may serve also as co-ordinators of work between the school and the employment or work of the pupil. By co-ordinator is meant the person who supervises or correlates the class instruction and the practical experience of part-time students."

The State plan provides that any person appointed as a part-time co-ordinator, approved by the State Board, may be reimbursed for time spent doing such work, in accordance with the plan for reimbursement.

- (c) Unit trade classes will be organized in day schools for the purpose of preparing persons over 14 years of age for trade or industrial pursuits.
- (d) In day schools in towns and cities of less than 25,000 population industrial classes will be encouraged wherever practicable, to meet the needs of the community. Instruction will be given in shop work, carpentry, printing, molding, etc., as the needs of the pupils may dictate.

B. In evening industrial schools and classes.

- (a) The controlling purpose shall be to supplement the daily occupation of the worker in such way as to increase vocational efficiency.
- (b) Only persons over 16 years of age shall be admitted to these courses.
- (c) The plant and equipment shall be such as to satisfy the State Board that ample facilities are provided for proper instruction.
- (d) A minimum for maintenance is required which will insure teachers who meet the standards set up by the State Board, and adequate supplies.
- (e) The course of study shall be submitted to the State Board for approval. The character and content of the course of study shall be such as to increase the skill or knowledge of the worker in the occupation in which he is engaged. In evening schools the short unit course will be most effective.

The following unit course is suggestive of what may be offered in the evening schools:

*Carpentry.*

A unit course for carpenters and joiners to be offered in evening schools may include the following:

	Lessons.
C-1. Shopwork in house framing.....	10
C-2. Shopwork in roof construction.....	10
C-3. Shopwork in floor laying and inside finishing.....	10
C-4. Shopwork in stair building.....	10
C-5. Shopwork in outside trimming.....	10
C-6. Mill-room practice .....	5
C-7. Saw filing .....	5
C-8. The carpenter's steel square.....	5
C-9. A study of building materials.....	10
C-10. Mathematics for carpenters and joiners.....	20
C-11. Elementary plan reading for carpenters.....	10
C-12. Elementary sketching and drawing for carpenters and joiners	10
C-13. Construction of arches for bricklayers.....	10
C-14. Specifications and details.....	20
C-15. Advanced plan reading and estimating.....	10
C-16. The building ordinances of Richmond.....	10
C-17. Time keeping and cost distribution.....	10
C-18. Figuring cost of small structures.....	20
C-19. Writing specifications and business letters.....	20
C-20. Study of materials of construction and city ordinances for esti- mators of large structures.....	10
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The following is given as an example of the lessons which may be planned for a particular unit. In this case C-8 is chosen.

*C-8. The Carpenter's Steel Square.*

Lesson 1. Oral instruction: Anatomy of the steel square, general uses, markings or graduations (a) board measure, (b) rafter measure, (c) brace measure, and (d) diagonal scale of 160ths of an inch.

Lesson 2. Demonstrate the use of the board measure; name the accessories for working out steel square problems; demonstrate the use of the steel square in dividing a board into any number of equal parts; the method of finding the number of degrees in each angle of a regular polygon; of finding the degrees in the miter of a polygon; demonstrate the method of finding the figures upon the square which will give the angles and miters of a polygon; construct by this method an equilateral triangle, a rectangle, a hexagon, an octagon.

Lesson 3. Demonstrate the method of bisecting an angle with the steel square; of finding the center of a circle which will pass through three given points; the method of finding the greatest square which can be contained



within a given circle; of finding a square one-half the area of a given square; the method of finding a square twice the area of a given square. Demonstrate practical applications of the preceding principles.

Lesson 4. Demonstrate the method of constructing a circle equal in area to two given circles; how it may be applied to any number of circles; demonstrate the use of the octagon scale; demonstrate what figures upon the side of a square will give the width of the side of an octagon; name some other tool that may be used in the same way; demonstrate the method of finding the sides of an octagon from the diagonals of a square; the method of finding from a given side the width of an octagon. Illustrate the preceding principles by practical applications.

Lesson 5. Demonstrate the method of finding from a given side the width of a hexagon; of finding the diagonal of an octagon from its given side; given the side of a hexagon, find its diagonal; given the width of an octagon, find the length of the side; given the width of a hexagon, find the length of the side. Illustrate the preceding principles by practical application.

Note: In working out steel square problems, use a planed board, 12" or 15" wide, and about 3' long, one edge of which should be jointed perfectly straight and square.

- (f) Evening school instruction shall be given only in such subjects as will increase skill or knowledge in the occupation in which the worker is engaged as his daily employment, or as will lead to promotion or advancement in that work. In communities where it is impossible to secure a sufficiently large enrollment to warrant the establishment of an evening school class in a particular trade, it may be possible to arrange a course which will give instruction supplementary to the daily employment to persons from closely allied occupations, but the fundamental consideration must be kept in mind that all instruction in the evening schools under discussion must be of demonstrable value in the daily occupations of the pupils taking the work. Thus, it is entirely practicable to arrange a course in reading architectural drawings for carpenters, masons, bricklayers, plumbers, and electricians which would provide instruction of value to a class composed of men from all of these trade. Such a course would not be designed however, to make draftsmen but to enable the students to read the drawings.
- (g) The methods of instruction shall be those practiced in the best ordered commercial shops rather those of a regular manual training department in the ordinary school, and will depend largely upon the character of the particular school or class. The work of the class shall, however, be shaped in accordance with actual experience and the daily employment of the group taking the work.
- (h) (1) The qualifications of teachers in specific shop subjects shall be academic training at least equivalent to that

required in the elementary schools and practical shop experience at least two years beyond the apprenticeship stage.

- (2) For teachers of related subjects the completion of at least two years of college work (one-half of which should be in technical and scientific subjects, with a satisfactory contact with shop conditions), or the equivalent in experience and ability, subject to approval by the State Board.

C. (a) In part-time schools or classes trade extension courses may be offered.

- (1) The controlling purpose of such courses is to increase the efficiency of persons engaged in some useful occupation. The course will be adapted to the needs of those who are engaged in factories, shops, etc., with the idea of aiding their vocational and intellectual advancement.

Persons definitely scheduled for employment, by a written contract with the employer, may be given, before being employed, instruction in a trade or extension part-time class, fitting them for more advantageous entrance to such employment.

- (2) The course shall be designed for persons over 14 years of age, without upper age limit, who have entered upon employment, provided the instruction given is (a) designed for and suitable to enlarge the civic and vocational intelligence of workers over 14 and less than 18 years of age and (b) given not less than 144 hours per year.
- (3) The plant and equipment shall be such as to satisfy the State Board that the purposes of the course can be carried out in a satisfactory manner.
- (4) A minimum for maintenance shall be required which will insure that teachers of satisfactory qualifications can be secured, and adequate supplies provided.
- (5) The character of the course shall be determined by the vocational and intellectual needs of the pupils and the content such as will couple the course directly with the actual occupation in which the pupils are engaged.

A typical trade-extension course for machine shop apprentices would include the following courses: shop drawing, shop mathematics, shop science, and a study of tools and materials.

- (6) The methods of instruction shall adapt the work of the school as far as possible to the demands of the shop, factory, or other occupations. By shop inspection and a careful study of shop conditions the school can be made a continuation of shop practice with such added

training as will make the work more efficient practically as well as socially.

- (7) Instruction given may be for a few hours per week; in some cases pupils may be a half day in the school and a half day in the commercial shop, or two weeks of constant instruction may be followed by the same period in their work. Still other courses are laid out to cover slack seasons, where apprentices in the trade may be excused for one, two or three months of continuous school instruction. In all cases however, the course shall cover a minimum of 144 hours of class instruction per year.
- (8) (a and b) The qualifications of teachers shall not be less than the minimum required for the evening schools or classes.
- (b) Trade preparatory part-time schools or classes may be conducted under the direction of the State Board.

- (1) The controlling purpose is to give instruction designed to fit persons for some useful employment other than the trade or industry in which they are engaged.

Persons definitely scheduled for employment by written agreement with the employer, may be given, before being employed, instruction in a part-time class fitting them for advantageous entrance to such employment.

- (2) Pupils shall be over 14 years of age. The course shall be designed for persons over 14 years of age, without upper age limit, who have entered upon employment, provided the instruction is, (a) designed for and suitable to enlarge the civic and vocational intelligence of workers over 14 and less than 18 years of age, (b) and given not less than 144 hours per year.
- (3) The plant and equipment shall be the same or similar to that required for trade extension work.
- (4) The minimum for maintenance shall be such as to insure teachers of approved qualifications, with funds for sufficient supplies.
- (5) The character and content of the course will vary with the needs of pupils, but in general must conform to the requirements for trade extension classes.

Classes in trade preparatory part-time schools should not attempt to teach trades which, because of a great length of time needed for their mastery, cannot properly be given in the intermittent instruction of trade preparatory part-time classes. As an example of what the trade preparatory part-time classes can do the following illustration is given: if a person, who is working as a sheet metal worker with a firm that also con-

tracts for plumbing, wishes to become a plumber, he might take in the trade preparatory part-time school such courses as drawing and blue print reading, study of State and city rules and regulations governing the trade, proper means of installation of plumbing, shop work, pipe fitting, etc., cost estimating, etc., and applied science.

- (6) The methods of instruction shall conform to the general methods in the trade extension instruction.
  - (7) The length of term shall be the same as that for trade extension part-time schools.
  - (8) Teachers must have the same qualifications as required for trade extension instruction.
- (c) General continuation part-time schools or classes may be offered.
- (1) The purpose of the course shall be to increase civic or vocational efficiency.

Persons definitely scheduled for employment, by a written contract with the employer, may be given, before being employed, instruction in general continuation part-time schools or classes, fitting them for more advantageous entrance to such employment.

- (2) The course shall be designed for persons over 14 years of age, without upper age limit, who have entered upon employment, provided the instruction given is (a) designed for and suitable to enlarge the civic or vocational intelligence of workers over 14 and less than 18 years of age, and (b) given not less than 144 hours per year.
- (3) The minimum requirement for plant and equipment shall be such as will satisfy the State Board that ample facilities for the course are provided.
- (4) For maintenance an amount shall be guaranteed which will enable well qualified teachers to be employed, and adequate supplies provided.
- (5) The course of study may provide special training related to the daily occupation of the worker or a general academic course intended to increase civic and vocational efficiency.

General continuation part-time classes may provide special training related to the daily occupation of the worker or they may be formed to give instruction to mixed groups from various occupations in such subjects as English, civics, history of industries, arithmetic, trade mathematics, or any commercial branch or elementary of high school subject.

Similar classes can be formed for women in stores or factories in home economics subjects, commercial subjects, industrial subjects (not trade extension), or preparatory and general education subjects.

Such part-time classes must be classes which divide the working day or school time instruction and practical work in shop, factory, home, office, etc. The division of time may be so arranged as to apportion or distribute the total working days so that a portion of it is given to school instruction; or to distribute the total time so that a portion of it is given to employment in shop, factory, home, office, etc. In some cases, pupils may be a half day in school and a half day at work; in other words, they may have alternate days or alternate weeks at work and in school; or two weeks of constant instruction may be followed by the same period at work. Still other courses can be laid out to cover the slack seasons when pupils may be excused for one or two or three months of continuous school instruction.

- (6) For special branches and subjects taught the method of instruction shall closely relate shop experience and school work. Academic branches shall be presented in such manner as will inspire love of country.
- (7) The length of term shall be not less than 144 hours.
- (8) For shop subjects and related branches the qualifications of teachers shall be equivalent to those fixed for the evening classes. For other subjects taught, two years of study in advance of the high school grades are required.

D. The State Board proposes, when practicable, to establish day unit trade schools or classes.

- (a) The controlling purpose will be to fit persons for useful employment in some trade or industry.
- (b) The age of admission shall be not under 14 years.
- (c) The plant and equipment must be adequate to teach in a satisfactory manner the trade or industry.
- (d) A minimum for maintenance is required to provide salaries for qualified teachers and to furnish the necessary materials for carrying on the work.
- (e) The course of study may vary in length from one to four years. Non-vocational and related work shall not require more than fifteen clock hours per week, and non-vocational courses may include such subjects as English, penmanship, history, (including industrial history), commercial geography, civics, hygiene, and related work including such subjects as related mathematics, shop drawing, related science, etc.

The following course is typical of what may be offered in a day unit-trade school having a three-year course:

## SKELETON COURSE MACHINIST'S TRADE—THREE YEARS.

<i>First Year.</i>	<i>Hours per week.</i>
Shop Work—Machine shop practice on useful or productive basis .....	15
Related mathematics .....	5
Related Subjects—Related Science .....	2
Related Drawing .....	3
Non-vocational—English .....	3
Civics .....	2
Total .....	30

<i>Second Year.</i>	<i>Hours per week.</i>
Shop Work—Machine shop practice on useful or productive basis .....	15
Related Mathematics .....	3
Related Subjects—Related Science .....	2
Related Drawing .....	5
Non-vocational—Industrial History .....	2
English, Civics .....	3
Total .....	30

<i>Third Year.</i>	<i>Hours per week.</i>
Shop Work—Machine shop practice on useful or productive basis .....	15
Related Mathematics .....	3
Related Subjects—Related Science .....	3
Related Drawing and Trade information .....	5
Non-vocational—English or an elective.....	5
Total .....	30

The foregoing is submitted as an illustration of a possible division of time for (a) shopwork, (b) related subjects, and (c) non-vocational subjects, and should in no sense be accepted as a required arrangement.

## UNIT COURSE FOR MACHINE SHOP WORK.

<i>Unit Letter and Number.</i>	<i>Name of Unit.</i>	<i>Approximate Number of Hours Required.</i>
M-1.....	Floor and bench work.....	270
M-2.....	Lathe work .....	300
M-3.....	Use of mandrel .....	150
M-4.....	Drill press and radial drill.....	150
M-5.....	Horizontal and vertical boring mills..	150
M-6.....	Planer and shaper .....	150

M-7.....Duplicate work .....	150
M-8.....Grinder .....	100
M-9.....Tool making .....	200
Total .....	1,620

*Related Subjects.*

1. Mathematics.

Common fractions, simple equations, equivalents, percentage, ratio and proportion, mensuration and special short cuts applied to practical shop problems which will include wage computations and cost of production.

Calculating proper feeds and speeds of cutting tools and grinding wheels, simple and compound gears for thread cutting, speeds and dimensions of line shafts, pulleys, gears, horse-power of single and double ply belting, indexing gear work, taper computation.

Practical geometry and trigonometry as applied to the setting up of the machines, grinding of tools, and to other shop problems.

Strength of materials, conversion tables, squares, cubes, rests and logarithms, use of hand books and the various formulae.

2. Related Science.

Elementary mechanics involving the laws of the lever, wheel and axle, inclined plane, screw and wedge, as applied to machine shop work. Transmission of power by belts, gears, shafting, friction, rope and chain drives to be used as illustrations.

Elementary metallurgy covering the properties and composition of cast, malleable and wrought iron, steel, copper, brass, zinc, lead, and bab-bitt.

Composition, value and methods of testing lubricating oils, greases and cutting compounds.

Selection of materials for machine parts, including bearings, spindles, frames, wearing and cutting surfaces, parts under strains and vibration. Wear and oxidation of metals, crystalization of steels under various conditions.

Heat treatment of various metals covering the expansion and contraction, case hardening, tempering, and annealing.

3. Drawing.

Reading of typical shop working drawings, comparing drawings with rough and finished castings, noting carefully shape, dimensions and finish marks.

Freehand sketches of machine parts, lay-out work, tool designing, detail and assembly drawings of machine and machine parts, blue-printing.

4. Trade Information.

Use and manufacture of the materials of the trade, standardization of general shop supplies.

Cost of standard materials.  
Shop systems and records.  
Standardization of tools and equipment.  
Machine tools.  
Hand tools.  
Supplementary sources of information.  
Fire prevention.  
First aid.  
Function of the occupation and relative importance.  
conditions of employment.

- (f) Methods of instruction shall provide a sequence of experiences and of thought about experiences which will enable the pupil to acquire as rapidly as possible manual skill and texterity in various operations of the trade or industrial pursuit for which he is preparing. Methods shall develop ability to think and to work intelligently in the trade.
- (g) Not less than half the time or 15 hours per week must be given to practical work on a useful or productive basis. Printing of school forms in the print shop and making of school equipment, etc., illustrates the nature of the practical work which may be undertaken.
- (h) The school term shall be not less than nine months or thirty-six weeks.
- (i) At least thirty clock hours of instruction shall be given each week.
- (j) The qualifications of teachers shall be
  - (1) For shop or trade teachers, a journeyman of at least two years' experience above the apprenticeship stage, who shall have completed the course in teacher-training of not less than one nor more than three years, or the equivalent training until such a teacher-training course is offered.
  - (2) For teachers of related subjects, the completion at a technical college of a course in the related subjects at least two years in advance of the standard high school course or the equivalent in experience and ability, subject to approval by the State Board.
  - (3) For teachers of non-vocational subjects, completion of two years' work in the subjects to be taught at a college or normal school over and above the standard high school requirement.

Both the type of work and the grade of instruction shall be arranged to meet the needs of the community, provided, however, that the grade of instruction shall be less than college grade. As far as possible the academic subjects taught shall be correlated with the trades.

- E. In cities and towns of less than 25,000 population, industrial schools or classes may be conducted.



- (a) The controlling purpose shall be to fit for useful employment.
- (b) The work is designed to meet the needs of persons over 14 years of age.
- (c) A minimum for plant and equipment shall be required which in the estimation of the State Board will satisfy the demand of proper instruction.
- (d) A minimum for maintenance is required which will provide well qualified teachers and material necessary for the course of instruction.
- (e) The general character and content of the course of study shall be similar to that outlined for the day unit trade schools, subject to such modifications as may be made to meet the requirements of the community.
- (f) The methods of instruction in the day trade unit schools shall prevail in the general industrial school.
- (g) Half the time shall be given to practical work on a useful or productive basis.
- (h) The length of the school year shall be nine months.
- (i) Not less than twenty-five hours of instruction shall be given each week.
- (j) The qualifications of teachers shall be the same as those required for the day unit trade school.

### 3. Home Economics Education.

- A. A statement of kinds of Home Economics Education which the State Board intends to aid from Federal funds.
  - a. Evening home economics schools or classes.
  - b. Part-time home economics schools or classes wherever practicable.
  - c. Day schools or classes in cities of over 25,000.
  - d. Day schools or classes in cities or towns of less than 25,000.
- B. Evening home economics schools or classes.
  - a. Age of entrance shall be a minimum of 16 years.
  - b. Required or minimum plant and equipment.

These shall be of the same general character and of about equal cost to those stipulated for the regular day school. There should be good light, heat, and ventilation. The plant and equipment should duplicate home conditions as nearly as possible.

- c. Minimum for maintenance. Sufficient money must be paid to secure services of qualified teachers who are in full sympathy with the ideals and methods of evening school instruction. Sufficient funds should be available to maintain standards used as a basis for approving the school.
- d. Character and content of course of study.

The work will be organized on a short unit basis designed to meet the needs of a group of experienced home-makers and

a group of young women desirous of fitting themselves to be efficient home-makers. The subjects will be selected on the same basis. The following topics and courses are illustrative of the kind of work to be offered:

- (1) Feeding of the family.
- (2) Clothing of the family.
- (3) Care and welfare of children.
- (4) Care of the health of the family.
- (5) Management of the home.

*Clothing for the Family.*

Unit 1. Beginners' Unit.

The aim of this unit is to teach the fundamental processes of sewing. This is accomplished through the making of three garments, each one of which offers problems not met with in the other.

Problem I. Chemise:

- Lesson 1. Selection of pattern, cutting and fitting.
- Lesson 2. Hems, buttons and button-holes.
- Lesson 3. Neck and arm-hole finishes.
- Lesson 4. Neck and arm-hole finishes.

Problem II. Underskirt:

- Lesson 5. Use of sewing machine, cutting and basting.
- Lesson 6. Seam finishes.
- Lesson 7. Plackets.
- Lesson 8. Hems and flounces.

Problem III. Bungalo Apron:

- Lesson 9. Cutting and fitting (speed work).
- Lesson 10. Seams, neck and sleeve finishes.
- Lesson 11. Hem, placket and belt.
- Lesson 12. Laundering, removal of stains.

e. Character of school work.

This shall be supplementary to their daily work as home-makers.

f. Methods of instruction.

These shall be such as to encourage skill or knowledge in direct relationship with the employment of home-making. Practical lessons in nearly every phase of home-making shall be brought out in such way as to show what contribution can be made to the economy and general efficiency of home-making. Teachers are supposed to have a sympathetic contact with home occupations and practically in every lesson they should emphasize the individual and special importance of the work.

g. The qualifications of teachers shall be the same as those required for the day school or in lieu of technical and professional

training, trade experience of at least one year with academic training equivalent to the completion of the elementary grades may be accepted.

- C. Part-time home economics schools or classes.
  - a. Minimum age of pupils shall be 14 years.
  - b. The requirements for plant and equipment shall be the same or equivalent to that required for the all day school.
  - c. Minimum for maintenance. An amount sufficient to keep up standards established as a basis for approving the school. Sufficient money paid to secure the services of well trained teachers who are in full sympathy with the purposes and methods of part-time instruction.
  - d. The character and content of course of study shall be such as to develop the worker in her regular employment or such as to contribute to her vocational and social efficiency. Wherever practicable part-time courses in sewing, cooking, and in related subjects will be offered.

*Typical Unit Courses for Part-time Classes.*

**Unit 1. Fruits and Vegetables:**

- Lesson 1. Value of fruits and vegetables in the diet. Ways of using fresh fruit.
- Lesson 2. Preparation of dried fruits and use in diet.
- Lesson 3. Ways of cooking potatoes.
- Lesson 4. Cooking green vegetables.
- Lesson 5. Vegetables as conservers of other foods.
- Lesson 6. The vegetables dinner.

**Unit 2. The Housekeeper and the Food Problem:**

- Lesson 1. Discussion of the food problems of the housewife.
- Lesson 2. Home production of food.
- Lesson 3. Fuel and time-saving in food production.
- Lesson 4. Simplifying standards of living.
- Lesson 5. Economy in buying of foodstuffs.
- Lesson 6. Community kitchens.

- e. Methods of instruction. These shall be adapted to the authority, knowledge, experience and needs of the students.
- f. At least 144 sixty-minute hours of instruction per year shall be given. On the basis of the nine month's session the minimum requirements would be four hours per week.
- g. The qualifications of teachers shall be the same as those required for the day schools or in lieu of such technical and professional training, trade experience of at least one year with academic training through the elementary grades may be required.

**D. Day schools in cities over 25,000.**

- a. Minimum age of admission shall be 14 years.

- b. Required or minimum plant and equipment.
    1. A room approximately 22' x 28' equipped for food preparation and serving. A separate dining-room should be provided if possible.
    2. A room approximately 22' x 28' equipped with machines, lockers, etc., for garment making and dressmaking.
    3. A simply equipped bedroom for the teaching of home-making and the care of the bedroom.
    4. Laundry tubs and ironing equipment may be included in the provisions for the food laboratory unless a regular laundry can be installed.
  - c. A minimum for maintenance is required sufficient to employ properly trained teachers and to provide an amount of material of not less than \$5 per pupil per session.
  - d. Character and content of course of study. Two type courses of study may be used; one with the vocational half day given over entirely to home economics subjects, and the other with the vocational half day given over to home economics and related subjects.
1. Proposed two years' course with the vocational half day devoted to home economics subjects and the other half day devoted to general and related subjects.

*First Year.*

<i>Subject.</i>	<i>Time</i>	<i>Credit</i>
English	5 45-minute periods	1 unit
Arithmetic	5 45-minute periods	1 unit
General Science and Physiology and Hygiene	5 45-minute periods	1 unit
Home Economics:	5 180-minute periods	2 units
Textiles and Sewing	}	
Foods and Cooking		
House work, Laundry		

*Second Year.*

<i>Subject.</i>	<i>Time</i>	<i>Credit</i>
Civics and Citizenship	5 45-minute periods	1 unit
English	5 45-minute periods	1 unit
Drawing and Designing (applied to the home)	5 45-minute periods	1 unit
Home Economics:	5 180-minute periods	2 units
Dressmaking and Millinery	}	
Home Management, including meal planning, household ac- counts, division of the in- come, etc.		
Home nursing and care of chil- dren.		

2. Proposed two years' course with the vocational half day devoted to home economics and related subjects.

*First Year.*

<i>Subject.</i>	<i>Time</i>	<i>Credit</i>
English	5 60-minute periods	1 unit
Mathematics or History	5 60-minute periods	1 unit
Elective	5 60-minute periods	1 unit
Related Work	} 5 60-minute periods	1 unit
General Science		
Physiology and Hygiene		
Home Economics:	5 120-minute periods	1 unit
Textiles and Sewing and	}	
Foods and Cooking		

*Second Year.*

English	5 60-minute periods	1 unit
Mathematics or History	5 60-minute periods	1 unit
Elective	5 60-minute periods	1 unit
Related Work	} 5 60-minute periods	1 unit
Drawing and Designing		
Home Economics:	5 120-minute periods	1 unit
Home Management	}	
Meal Planning, Budget.		
Elementary Dressmaking		

e. Methods of instruction.

Courses involving practical work will not be separated into regular recitation and laboratory periods, but will combine in one class exercise as far as possible practical work and other essentials related to instruction as needed and as adapted to the subject.

- f. In schools where the vocational half day is devoted entirely to home economics subjects, 180 minutes per day is given to food and clothing study, a study of the purchasing of household supplies and equipment, the division of the family income, home nursing, etc. When the vocational half day is devoted to home economics and related subjects, the above topics are taken up, also the elementary principles of the sciences, and of drawing and design as applied to the household, provided at least 120 minutes a day be devoted to home economics subjects.

- g. The school year must be at least nine months in length.

- h. The hours of instruction shall be 30 hours per week.

- i. Qualifications of teachers:

1. Practical experience of at least one year before or after entering upon the courses in special training. Such experience may be secured as a helper in the home with some responsibility for management. Actual work under supervisor in the dormitory, cafeteria, etc., can be accepted as part of this requirement.
2. Home economic training. They must be graduates of a four-year course in Home Economics or its equivalent following a

standard four-year high school. The State Board at its discretion may accept as teachers of home economics, graduates of the two years' course of the State normal schools based upon the same conditions of entrance as the four-year course. Such graduates may be considered eligible for teaching home economics in part-time schools, in evening schools, and in regular all day schools, provided that after 1920 graduation from the four years' course as above outlined shall be required for teachers in the all day schools.

3. Professional training. They must have had professional training in general education and special methods applied to home economics with successful practice teaching, or experience in the teaching of home economics.

E. Day schools in cities and towns of less than 25,000.

- a. Minimum age of admission shall be 14 years.
- b. Required of minimum plant and equipment.

Two rooms, each approximately 25 feet square for food and clothing study with proper equipment costing about \$500. One large room may be used provided light, ventilation, and arrangement of equipment be adequate.

- c. Minimum for maintenance.

A minimum for maintenance is required sufficient to employ properly trained teachers, and to provide an amount for material of not less than \$5 per pupil per session.

- d. Character and content of the Course of Study.

A two-year course with the vocational half day devoted to home economics and related subjects is to be offered as follows:

*Course of Study for a Five-hour School Day in Which Half the Time is Devoted to Home Economics and Related Art and Science.*

One half day, or 150 minutes must be devoted to practical work. At least 90 minutes of this half day must be devoted to home economics subjects. To supplement this 60 minutes per day or 300 minutes per week must be devoted to related science and art.

*First Year.*

<i>Subject.</i>	<i>Time</i>	<i>Credit</i>
English	5 40-minute periods	1 unit
Mathematics, history or elective	5 40-minute periods	1 unit
Related Work:		
General Science	5 to 7 40-minute periods	} 1 unit
Drawing and Designing	3 40-minute periods	
Home Economics:	5 90-minute periods	1 unit
Sewing and Textiles	}	
Food study and Cooking		

*Second Year.*

English	5 40-minute periods	1 unit
Mathematics, history or elective	5 40-minute periods	1 unit
Related Work:		
Human Biology	5 to 7 40-minute periods	} 1 unit
Hygiene, sanitation	3 40-minute periods	
Home Economics:	5 90-minute periods	1 unit
Meal planning, and	}	
Sewing—Elementary		
Dressmaking		
e. Methods of instruction.		

Courses involving practical work will not be separated into regular recitation and laboratory periods, but will combine in one class exercise as far as possible practical work and other essentials related to instruction as needed and as adapted to the subject.

- f. Four hundred and fifty minutes per week are given to food and clothing study, the aim being to make the work applicable to the individual and home life of the student, and to establish good standards of living. Three hundred minutes per week are devoted to the study of the fundamental principles of the sciences relating to the home, and to drawing and designing as applied to house decoration and clothing.
- g. The school year must be at least nine months in length.
- h. The hours of instruction shall be 25 per week.
- i. The qualifications of teachers shall be the same as those for teachers in cities of more than 25,000.

## V. TEACHER TRAINING.

1. The State Board for Vocational Education proposes to distribute the funds for teacher training in the following manner:
  - A. For the training of agricultural subjects thirty-three and one-third per cent.
  - B. For the training of teachers of trade and industrial subjects thirty-three and one-third per cent.
  - C. For the training of teachers of home economics subjects, thirty-three and one-third per cent.
2. Agriculture.
  - A. Kinds of schools and classes.
    - a. For the training of white teachers of vocational agriculture, the State Board has established at the Virginia Polytechnic Institute, Blacksburg, a four years' course of training.
    - b. For the training of colored teachers of vocational agriculture, the State Board has established at the Virginia Normal and Industrial Institute, Petersburg, a two years' course of training.
    - c. It is proposed to improve teachers already in the service, as well as to develop an added supply of trained teachers. In the

summer of 1918, a brief course was given at the Virginia Polytechnic Institute under the State Supervisor of Agricultural Schools and the Supervisor of High Schools for the benefit of agricultural teachers already engaged in the work. The State Board has in mind, however, to furnish future teachers of agriculture with an equipment not only for knowing the subject, but for knowing well how to teach the subject.

The present State Supervisor of agricultural education will continue his efforts in improving the teachers in service, and will be assisted by the professor of agricultural education at the Virginia Polytechnic Institute and the director of the training school of the Virginia Polytechnic Institute.

- d. The State Board proposed to use the department of vocational agriculture at the Blacksburg High School as the training school for students in agricultural education at the Virginia Polytechnic Institute. The man in charge of this department is to be a member of the staff of the department of agricultural education at the Virginia Polytechnic Institute, and will have his schedule of work at the high school arranged so that he may devote a portion of his time to the training of teachers in service. The professor of teacher training at the Virginia Normal and Industrial Institute will devote a portion of his time to the improvement of colored teachers in service.

B. Length of Course.

The length of the course in agriculture for teacher training shall be four years, consisting of sixty college hours distributed as follows: Agriculture, twenty-four hours; Science, fifteen hours; Non-vocational subjects, twelve hours; and Educational subjects, fifteen per cent. of the total four-year course.

The length of the courses in agriculture for the training of colored teachers shall be two years, consisting of at least thirty college hours.

C. Entrance Requirements.

The requirements for entrance shall be graduation from a standard four-year high school, which means sixteen units for graduation. Not less than fourteen units may be accepted for entrance.

The normal course in Agriculture for colored teachers is based on graduation from the four-year high school course in vocational agriculture or its equivalent.

D. Courses of Study.



a. *Course of Agricultural Education to be Offered at Virginia Polytechnic Institute.*

<i>First Year</i>				<i>Second Year</i>			
	1	2	3		1	2	3
English .....	3	3	3	English .....	3	3	3
German .....	3	3	3	German .....	3	3	3
French .....				French .....			
Spanish .....				Spanish .....			
Algebra .....	3	3	—	Organic Chemistry....	3	3	3
Trigonometry .....	3	3	—	Prin. of Hort.....	—	—	3
Chemistry .....	3	3	3	Breeds of L. S.....	—	—	—
Zoology .....	3	3	—	Dairying .....	3	3	3
Str. Botany.....	—	—	3	Physics .....	3	3	3
Farm Crops.....	—	—	6	U. S. Hist. and Civics	3	3	—
Chem. Lab. ....	15	—	—	Farm Drawing.....	15	—	—
Farm Shop .....	—	15	—	Stock Judging.....	—	15	—
Syst. Botany.....	—	—	15	Quant. Anal., Survey- ing .....	—	—	15
<i>Third Year</i>				<i>Fourth Year</i>			
	1	2	3		1	2	3
English .....	3	3	3	Special Methods in Teaching Agriculture	3	3	3
Soils .....	3	3	—	Rural Economy.....	3	—	—
An. Nutrition.....	—	3	3	Sociology .....	—	3	3
Farm Building.....	3	—	—	Voc. Education.....	—	—	3
Farm Accounts.....	—	—	3	Bacteriology .....	3	—	—
Drainage .....	—	—	9	An. Breeding.....	—	3	—
Farm Mach. ....				Cereal Breeding.....			
Principles and Methods of Secondary Educa- tion .....	3	3	3	Farm Management....	—	3	3
Educational Psychology	3	3	—	Ec. Entomology.....	—	3	—
School Ad. and Mang.	—	—	3	Agr. Chemistry.....	3	3	3
Geology .....	3	3	—	Vet. Science .....	3	3	3
Plant Path. ....	—	3	3	Agr. Ed. Seminar....	1	1	1
Poultry Husb. ....	—	—	6	Ag. Chem. Lab.....	—	—	9
Orchard Tech. ....	6	—	—	Ec. Ento. Lab.....	—	1	—
Geol. Lab. ....	—	3	—	Bact. Lab. ....	15	—	—
Plant Path. Lab.....	—	6	—	Clinics .....	—	9	—
Soils, Lab. ....	—	6	—	Thesis .....	—	—	3
Farm Crops, Lab....	9	—	—	Practice Teaching....	—	3	3

b. *Normal Course in Agriculture to be Offered at the Virginia Normal and Industrial Institute.*

<i>First Year</i>			<i>Second Year</i>		
	1	2		1	2
English .....	5	5	English .....	5	5
Psychology .....	5	—	Animal Husbandry....	10	10
Vocational Education..	5	—	School Sanitation.....	—	—
Soils and Crops.....	10	10	High School Methods..	—	5
Principles of Teaching	—	5	Practice Teaching.....	5	5
Rural Hygiene .....	—	5			
	—	—		—	—
Total number of periods per week.	25	25	Total number of periods per week.	25	25

E. Provisions for Observation and Practice Teaching.

The course in teacher-training shall make ample provision for observation work and practice teaching. A course in agriculture has been placed in the high school adjacent to the Virginia Polytechnic Institute. The students in the teacher-training class will, therefore, have ample opportunity for observation and practice.

A course in vocational agriculture is in operation in the high school department of the Virginia Normal and Industrial Institute, which offers an excellent opportunity for observation and practice teaching by the students in the teacher-training department.

F. Graduation Requirements, Including Practical Experience.

In addition to the completion of the four-year course with appropriate observation and practice teaching, graduation requirements shall include also practical farm experience or farm contact of at least two years. This experience may be gained before the course in teacher-training has been completed, or after the completion of such a course.

G. Relation to Certification.

For those who complete the work as above outlined, the State Board of Education proposes to issue a special certificate to teach agricultural subjects.

3. Teacher-training for Trades and Industries.

A. The State Board for Vocational Education has designated the following institutions as centers for training teachers for Trade and Industrial subjects:

For training white teachers in Shop Subjects, Richmond City School Board.

For training white teachers in related subjects, Virginia Polytechnic Institute, Blacksburg, Va.

For training colored teachers in related and shop subjects, State Normal and Industrial Institute at Petersburg.

B. (a) Such courses will be conducted either by instructors who shall have had at least two years of education beyond the standard high school or its equivalent, satisfactory contact with at least two trades, and adequate and successful teaching, experience previous to taking up this work.

The students of these classes are to be recruited from the ranks of men who are skilled in these respective trades. It is assumed that such men cannot afford to drop their daily work and take up their training as they would at a school or college, hence the work must be offered during evening classes, dull seasons, and short term arrangements adapted to the respective conditions.

Where it is impossible to secure men for these classes who are skilled in their trade, an institution, which has

been designated by the State Board as a teacher-training center, may organize classes and train men in shop subjects, preparatory to their work in teacher-training. This condition applies particularly to the State Normal and Industrial Institute at Petersburg.

- (1) The requirement for admission demand at least elementary education through the 7th grade or its equivalent, an apprenticeship in the trade, at least one year as a journeyman, and a live interest in the teacher's job. In the event the apprenticeship and journeyman qualifications cannot be met at least one year of intensive trade school shop training may be accepted as the equivalent.
- (2) The length of the course shall be not less than one or more than three years. At least 120 hours of instruction should be given.
- (3) The following tentative program is offered for training shop teachers in Richmond City.

*First Half Year.*

FIRST TERM	HOURS	
Analysis and classification of trade knowledge (including detailed study of mathematics, science, drawing, and English.)	Monday, 7:30 - 9:30	Analysis and classification of trade knowledge.
Analysis and classification of trade knowledge	Tuesday, 7:30 - 9:30	Effectual instructional order.
Analysis and classification of trade knowledge	Thursday, 7:30 - 9:30	Methods of teaching.

*Second Half Year.*

Methods of teaching	Monday, 7:30 - 9:30	Instructional management.
Methods of teaching	Tuesday, 7:30 - 9:30	Theory and organization of vocational education.
Industrial resources	Thursday, 8:30 - 9:30	Government and industry.

*Summary of total hours for each subject.*

	<i>Hours.</i>
Analysis and classification of trade knowledge	40
Methods of teaching	25
Practice teaching	20
Effectual instructional order	10
Instructional management	10
Industrial resources	5
Government and industry	5
Records, legal obligations and responsibilities of teachers	5
Total	120

The same general program for training will be followed by the State Normal and Industrial Institute at Petersburg with such modifications as may be necessary, subject to the approval of the State Board and the Federal Board.

- (4) Provisions for observations and practice teaching will be made in Richmond City through the Trade and Industrial Schools organized there.  
Provisions for observation and practice teaching will be made at the State Normal and Industrial Institute through the trade and industrial classes organized at that institution.
- (5) The requirements for graduation at each center for training shall be the completion of the course.
- (6) The State Board of Education will award to those who complete the required course a special certificate to teach shop work.
- (b) Teachers of related subjects will be prepared at the Virginia Polytechnic Institute at Blacksburg, and the State Normal and Industrial Institute at Petersburg.
  - (1) The entrance requirements shall be graduation or the equivalent of graduation from a standard four-year high school.
  - (2) (a and b) A course in the related subjects must be of a college grade and extend through a period of at least two years.
  - (3) The following tentative program is offered for training teachers of related subjects at the Virginia Polytechnic Institute.

*Virginia Polytechnic Institute Course for Teachers of Trades.*

	<i>First Year.</i>	<i>1</i>	<i>2</i>	<i>3</i>
English (10) .....	3	3	3	3
Algebra (80) .....	3	3	3	3
Trigonometry (86) .....	3	3	3	3
Physics (104) .....	3	3	3	3
Chemistry (120) .....	3	3	3	3
Physical Laboratory (112) .....	—	4	4	4
Chemical Laboratory (129) .....	—	4	4	4
Drawing (410) .....	7	4	3	3
*Shop Work (430) .....	8	3	4	4
Military .....	6	6	6	6

\*500 hours in summer—General Carpentry or specialty.

*Second Year.*

English (1) .....	3	3	3
Physics (105) .....	3	3	3

Chemistry (121) .....	3	3	3
Analytic Geometry .....	3	3	3
Surveying (330) .....	3	—	—
Descriptive Geometry (424) .....	—	3	3
Elective .....	3	3	3
Physical Laboratory (113) .....	8	—	—
Surveying (Field Work) .....	7	—	—
*Drawing (411) .....	—	7	4
**Shop Work (433) .....	—	8	7
Military .....	6	6	5

\*Principally Mechanical Drawing, but a short part of the course is devoted to Technical Freehand Drawing.

\*\*500 hours in summer. Forge and Foundry, or specialty.

### Third Year.

English (12) .....	3	3	3
Mechanism (422) .....	3	3	3
Logic (18) .....	3	—	—
Psychology (25) .....	—	3	3
Material of Engineering .....	3	—	—
Applied Mechanics .....	—	3	3
Calculus (92) Elective .....	6	3	—
Elective .....	3	—	—
General Methods of Teaching .....	—	3	3
*Drawing .....	—	15	—
Testing Materials (laboratory) .....	—	—	15
**Shop Work .....	15	—	—
Military .....	6	6	6

\*Mechanical Drawing—the making of Shop Drawings.

\*\*\*500 hours in summer. Forge and Foundry or specialty.

### Fourth Year.

Methods of Teaching in Industrial Schools.....	3	3	—
Practice Teaching .....	—	—	6
Administration of Industrial Schools.....	3	3	—
Constitution of Alloys (180) Elective.....	3	—	—
Applied Mechanics (including strength of materials)	3	3	3
Métallurgy (170) Elective.....	—	3	3
Elective .....	3	3	—
Thesis .....	—	—	3
Architectural Drawing .....	15	15	—
Shop Work .....	—	—	15
Shop Work .....	—	—	15

Notes: 1. The numbers in parenthesis refer to sections in the catalogue of the Virginia Polytechnic Institute; the italic numbers designate terms of twelve weeks' duration into three of which the session is divided; the num-

bers columnated specify the number of hours per week the subject will be taught.

2. All subjects specified are to be of collegiate grade.

The preceding program will be carried out at the State Normal and Industrial Institute at Petersburg with such modifications as are necessary subject to the approval of the State Board and the Federal Board.

(4) Provisions for observation and practice teaching will be provided both in the lower classes of the Virginia Polytechnic Institute and in the public high school adjacent to the Institute. At the State Normal and Industrial Institute, similar provisions will be made in the classes at the Institute.

(5) The requirement for graduation will be the completion of the course.

(6) To those who complete the course, a special certificate to teach the appropriate related subject will be given.

C. For the preparation of teachers for the general continuation work, appropriate courses are offered at the Virginia Polytechnic Institute.

(1) Entrance requirements shall be graduation from a four-year high school, or the equivalent thereto.

(2) The course of study shall be of college grade, and not less than two years in duration.

(3) The course of study for general continuation part-time school teachers will not differ greatly from that for related subjects teachers as described and outlined above. Such modifications will be made as experience may show necessary, subject to the approval of the State Board.

(4) Practice teaching and observation work is required in this course as in those above outlined.

(5) Requirements for graduation shall be completion of the course.

(6) The State Board of Education will issue to those completing such a course a special certificate to teach the particular subject or subjects.

4. Home Economics.

A. The training of white teachers is done at the Harrisonburg State Normal School, and at the College of William and Mary. Colored teachers will be trained at the Virginia Normal and Industrial Institute, Petersburg.

a. Improvement of teachers in service and itinerant teacher training will be done by means of conferences at teachers' institutes, summer courses, monthly letters, thorough advice and suggestions of the supervisor on her visits.

B. The entrance requirements shall be the completion of a standard four-year high school course, with one year of practical experi-

- ence obtained before or after entering upon the course in special training.
- C. (a) The course of study shall be of collegiate grade and four years in length. For negro teachers a two-year course over and above the requirements of a standard high school is required.
- (b) At Harrisonburg Normal School and the College of William and Mary approximately one hundred and twenty credits are required. At the Virginia Normal and Industrial Institute approximately sixty credits are required.
- D. Course of Study.

*The Basis of Credit.*

In the above schedule one "credit" means three class hours, as follows, or some similar combination.

1. One recitation or lecture hour and two hours of preparation.
2. Two laboratory hours and one hour of preparation.
3. Three laboratory hours requiring no preparation.

*State Normal School for Women at Harrisonburg, Virginia. Four-Year Course for the Training of Teachers in Home Economics.*

*First Year.*

	CLASS 6					
	Periods			Credits		
	I	II	III	I	II	III
Biology 10—General Biology.....	0	3	0	0	3	0
Education 10—Orientation.....	5	0	0	3	0	0
Education 11-12—Education Psychology.....	3	3	0	3	3	0
English 10—Fundamentals in English Language.....	3	0	0	3	0	0
Home Economics 11-12-13—Sewing and Textiles.....	4	4	4	2	2	2
Home Economics 14-15-16—Cooking.....	6	6	6	3	3	3
Home Economics 17-18—House Work.....	0	4	4	0	2	2
Home Economics 40—Laundrying.....	0	0	4	0	0	2
Manual Arts 15 16-17—Drawing for Home Economics.....	3	3	3	1	1	1
Manual Arts 40—Home Mechanics.....	0	3	0	0	1	0
Physical Education 11-12-13—Gymnastics.....	3	3	3	1	1	1
Physical Education 15—Physiology and Hygiene.....	0	0	5	0	0	5
Physical Science 14-15-16—Inorganic and Analytical Chemistry.....	6	6	6	3	3	3
	33	35	35	19	19	19

## Second Year.

Biology 31—Advance Nature Study and Gardening...	0	0	6	0	0	4
English 20—Reading and Literature...	5	0	0	5	0	0
English 21—Literary Epochs...	5	0	5	5	0	5
History 24—Sociology...	0	5	0	0	5	0
History 25—Ethics...	0	0	2	0	0	2
History 26—American Government...	0	3	0	0	3	0
History 41—Industrial History...	0	3	0	0	3	0
Home Economics 23-24-25—Foods and Cookery...	4	4	4	2	2	2
Home Economics 28—Advanced Textiles; Chemistry of Textiles...	0	0	4	0	0	2
Manual Arts 20—Art Appreciation...	2	0	0	1	0	0
Manual Arts 27-28-29—Design...	3	3	3	1	1	1
Music 20—Music Appreciation...	2	0	0	1	0	0
Physical Education 10—Home Nursing...	0	2	0	0	1	0
Physical Education 21-22—Gymnastics, Games and Plays...	3	3	0	1	1	0
Physical Science 24-25-26—Organic and Household Chemistry...	6	6	6	3	3	3
	30	29	30	19	19	19

## Third Year.

Biology 49—Bacteriology...	0	4	0	0	3	0
Education 31-32—Genetic and Adolescent Psychology...	5	5	0	1	5	0
English 35-36—Practical Composition; American Literature...	0	3	3	0	3	3
History 31—Recent American History...	3	0	0	3	0	0
History 42—Rural Sociology...	3	0	0	3	0	0
History 43—Economics...	0	0	3	0	0	3
Home Economics 10—Methods and Observation in Home Economics Teaching...	0	0	3	0	0	3
Home Economics 26-27—Costume Design...	4	4	0	2	2	0
Home Economics 30—House Furnishing...	0	7	2	0	0	1
Home Economics 31-32-33—Advanced Sewing and Dressmaking...	6	6	6	2	2	2
Home Economics 37—House Planning...	0	2	0	0	1	0
Home Economics 38-39—Millinery...	2	0	2	1	0	1
Home Economics 48—Household Budgets...	0	7	3	0	0	3
Physical Science 31-32-33—Physiological Chemistry...	4	4	4	4	4	4
	27	28	26	18	18	18

## Fourth Year.

Education 20—Practice Teaching and Practice Home Education...	8	8	8	4	4	4
Education 41-42-43—History and Philosophy of Education...	3	3	3	3	3	3
Education 46—Principles of Education...	0	0	3	0	0	3
English 40—Public Speaking...	0	0	2	0	0	2
History 44—History of the Family as a Social Institution...	2	0	0	2	0	0
Home Economics 21-22—Theory of Teaching Home Economics...	3	3	0	3	3	0
Home Economics 34-35-36—Nutrition; Dietetics...	4	4	4	3	3	3
Home Economics 47—Community Work...	0	5	0	0	5	0
Physical Science 47—History of Science...	3	3	0	3	0	0
Physical Science 48—Household Physics...	0	0	4	0	0	3
	23	23	24	18	18	18



Course of Study in Teacher Training for Vocational Domestic Sciences for Negro Teachers.

FIRST YEAR	No. of Recitations per week		No. of Minutes per week	
	I	II	I	II
Physiology, with Reference to the Same.....	5		200	
Principles of Teaching.....	4		160	
Methods in Common School.....				
Branches.....	3	3	120	120
English.....	5	5	200	200
Public School Music.....	2	2	80	80
Cooking.....	3	3	240	240
Household Chemistry.....	2	2	160	160
Sewing and Textiles.....	3	3	240	240
Art Needle Work.....		3		240
Drawing and Applied Design.....	2	2	80	80
Conservation and Methods of Domestic Science Teaching.....	1	1	80	80
	30	24	1,560	1,640

  

SECOND YEAR				
Food and Cooking.....	5		200	
General Biology.....	5		200	
English.....	5	5	200	200
House Planning and Decoration.....	2		160	
Business Methods.....	2		80	
Millinery.....	2		160	
Feeding and Care of Babies.....	2		80	
Drawing and Costume Design.....	2		80	
Observation and Practice Teaching in Domestic Science.....		15		600
Invalid Cooking.....		2		160
Canning and Preserving.....		2		160
Laundering.....		2		160
Dressmaking.....	2	2	110	160
Totals.....	27	28	1,320	1,440

Present plans provide for at least two rooms which may be used as a model of housekeeping, in which teacher-training students can work for four weeks under supervision. With the opening of another session, a dormitory can be provided in which this work will be carried on.

*Proposed Course for the Training of Teachers of Home Economics,  
College of William and Mary.*

FIRST YEAR	First Term				Second Term		
	Cl.	Lab.	Cr.		Cl.	Lab.	Cr.
Biology .....	3	4	5	Physiology .....	3	4	5
English .....	3		3	English .....	3		3
Chemistry .....	3	4	5	Chemistry .....	3	4	5
Textiles and Sewing .....	1		2	Textiles and Sewing .....	1	2	2
Drawing and Design .....		2	1	Drawing and Design .....		2	1
Electives .....	2	2	2	Electives .....	2		3
	12	12	18		15	12	18

  

SECOND YEAR							
English .....	3		3	English .....	3		3
Organic Chemistry .....	3	4	5	Chemistry of Food and Nutrition .....	3	2	4
History .....	3		3	Mathematics .....	3		3
Foods and Cookery .....	2	4	4	Foods and Cookery .....	2	4	4
Elementary Dressmaking .....		3	1½	Elementary Dressmaking .....		3	1½
Electives .....	2		2	Electives .....	2		2
	13	11	18½		13	9	17½

  

THIRD YEAR							
Applied Physics .....	3	4	5	Bacteriology .....	2	4	4
General and Educational Psychology .....	3		3	General Methods .....	3		3
Advanced Cookery .....		3	1½	Institution .....			
Advanced Dressmaking and Millinery .....		4	2	Advanced Dressmaking and Millinery .....		4	2
Costuming .....		2	1	Costume Design .....		2	1
Home Management .....	2		2	Home Planning and Furnishing .....	2		2
Electives .....	2		2	Electives .....	3		3
	10	13	16½		10	13	16½

  

FOURTH YEAR							
Methods of Teaching .....				Methods of Teaching .....			
Home Economics .....	2	2	2	Home Economics .....	2		2
Practice Teaching .....	2		2	Practice Teaching .....	2		2
Demonstration .....				Experimental .....			
Cookery .....		2	1	Cookery .....		2	1
Nutrition and Dietetics .....	2		2	Nutrition and Dietetics .....	2		2
Economics .....	2		2	Sociology .....	2		2
Principles of Vocational Education .....	2		2	Home Nursing and Care of Children .....		2	1
Electives .....	4		4	Electives .....	4		4
	14	2	15		12	4	14

Physical training throughout the course, or at least for two years.

- E. Observation and practice teaching will be obtained in the schools of the towns in which the institutions are located, and in neighboring rural schools. At Petersburg, an elementary and a high school are maintained in the institution, and practice teaching is done there.
- F. Graduation Requirements. Satisfactory completion of the required course with supervised home experience in the practice house, or by other means provided by the institution.
- G. The State Board will issue to those who have completed the required course a special certificate to teach home economic subjects.



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